

### **REMARKS/ARGUMENTS**

Reconsideration and withdrawal of the rejections of record are respectfully requested.

#### **Summary of Status of Amendments and Office Action**

Upon entry of the above amendment, claim 16 will have been cancelled. Accordingly, claims 1-15, 17-19, and 22 will be pending in the application with claims 1, 17, and 22 being independent.

In the Office Action, claim 16 is rejected under 35 U.S.C. §§ 103(a) and 112, first paragraph; claims 1-12, 17, and 22 are rejected under 35 U.S.C. § 102(b); and claims 13-15, 18, and 19 are rejected under 35 U.S.C. § 103(a).

#### **Amendments to the Claims**

Claim 16 has been cancelled. Claim 17 has been amended to narrow the operating temperature range from 350° C to 450° C, rather than from 350° C to 480° C, in order to more closely conform the claimed range with operating temperatures set out in Table 6 (at page 18) of the specification.

Entry of this amendment is respectfully requested insofar as it contains no new matter, raises no new issues, and places the claims in better form for consideration on appeal.

#### **Response to the Rejection of Claim 16 Under 35 U.S.C. § 112**

In the Office Action, the Examiner rejected claims 16-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

By the present amendment, claim 16 is cancelled. Applicants accordingly respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 112, first paragraph.

#### **Response to the Rejection of Claims 1 to 12, 17, and 22 Under 35 U.S.C. § 102(b)**

Claims 1-12, 17, and 22 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,638,106 to Pieters *et al.* (Pieters), which incorporates by reference U.S. Patent

No. 3,702,886 to Argauer *et al.* (Argauer). The Examiner cites Pieters as disclosing conversion of oxygenate (such as methanol) with aromatic cofeed (such as xylenes) in the presence of zeolite such as ZSM-5 having gallium in the framework. Given that the rejected claims each encompass claim 1's limitation that the catalyst has a Si/Ga ratio ranging from 5 to 500, the Examiner argues that the abstract of the Argauer patent, which Pieters incorporates by reference, teaches this Si/Ga ratio. Applicants have earlier argued this ratio is missing from Pieters. This rejection is respectfully traversed.

In order for a reference to anticipate a claim, the reference must show each and every element recited by the claim. Moreover, the prior art must contain an enabling disclosure. *Chester v. Miller*, 906 F.2d at 1546, n. 2, 15 USPQ2d at 1336 n. 2 (Fed. Cir. 1990). A reference contains an enabling disclosure if a person of ordinary skill in the art could have combined the description of the invention in the prior art reference with his own knowledge of the art to have placed himself, and thereby the public, in possession of the invention. *In re Donohue*, 766 F.2d 531, 533, 226 USPQ 619, 621 (Fed. Cir. 1985).

The abstract of Argauer on which the Examiner relies, provides a generic formula containing  $W_2O_3 \cdot 5-100YO_2$  wherein W is selected from aluminum and gallium, whilst Y is selected from silicon and germanium. Thus, the formula broadly covers aluminosilicates, gallosilicates, aluminogermanates, and gallogermanates. The Examiner apparently extrapolates a Si/Ga mole ratio from this formula of 2.5 to 50, i.e.,  $(5 \text{ to } 100)/2$ , which overlaps Applicants' claimed range of 5 to 500. However, no disclosure is provided within Argauer for a range *specific to gallosilicates*.

In contrast, Pieters, which incorporates Argauer by reference for its general gallosilicate ZSM-5 zeolite teachings, goes *further* in describing Si/Ga ratios for those gallosilicates used in Pieters' specific invention, namely, in the conversion of alcohols to lower olefins. Immediately following the incorporation by reference of Argauer, Pieters, at column 11, lines 38-43, teaches "[s]uch gallosilicates for purposes of the present invention typically are synthesized to possess an effective silica to gallia mole ratio, to impart the aforescribed acidity thereto, of typically from about 1:400 to about 1:100, preferably from about 1:300 to about 1:150." This differs significantly from Applicants' presently claimed Si/Ga molar ratio 5:1 to 500:1, which teaches at

least 500 times more Ga than what Pieters explicitly specifies for gallosilicates. Moreover, Argauer's generic Y/W range given in the abstract (2.5:1 to 50:1) appears to be totally outside that range taught by Pieters (0.0025:1 to 0.001:1) for a gallosilicate catalyst used to convert oxygenates to olefins. Given this specific teaching of a Si/Ga range for use in oxygenate conversion to olefins, one skilled in the art would likely follow Pieters' explicitly disclosed range for gallosilicates instead of the conflicting generic range provided by an incorporated reference. Indeed, Argauer, while teaching the use of its catalyst in various other hydrocarbon conversions, fails to disclose or suggest its use in converting oxygenates to olefins.

Given that Argauer provides only generic  $W_2O_3$ :5-100YO<sub>2</sub> ranges that are not specific for gallosilicates, and further given that Pieters does provide *explicit* Si/Ga ranges for *gallosilicates*, and further, *in the context of oxygenate conversion to olefins*, one skilled in the art would look to Pieters' explicit teaching for Si/Ga ratio, rather than Argauer's conflicting ratios. Alternately, it can be argued that the conflict between Argauer's and Pieters' mutually exclusive ratios fails to enable one skilled in the art to have placed the public in possession of the presently claimed invention. In either case, Applicants submit the Examiner has failed to show that the prior art anticipates the subject matter of these claims. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection.

#### **Response to the Rejection of Claim 16 Under 35 U.S.C. § 103(a)**

Claim 16 is rejected under 35 U.S.C. § 103(a) as being obvious over the Pieters patent in view of U.S. Patent No. 4,861,938 to Lewis *et al.* (Lewis). This rejection is respectfully traversed. By the present amendment, claim 16 is cancelled, and withdrawal of the rejection is therefore respectfully requested.

#### **Response to the Rejection of Claims 13-15, 18, and 19 Under 35 U.S.C. § 103(a)**

Claims 13-15, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being obvious over Pieters, in view of U.S. Patent No. 6,150,293 to Verduijn *et al.* (Verduijn). In the Office Action, the Examiner acknowledges that the Pieters patent does not disclose using a zeolite bound zeolite catalyst as required by claims 13-15, 18, and 19. The Examiner, thus, relies upon the abstract in

Verduijn, column 5, lines 10 to 30, and column 9, section (u), for teaching the use of zeolite bound zeolite catalysts for converting oxygenates to olefins. Accordingly, the Examiner considers that the claimed method of claims 13-15, 18, and 19 would have been obvious. Applicants respectfully traverse this rejection.

Applicants respectfully submit that Pieters, despite its incorporation by reference of Argauer, fails to disclose or suggest the Si/Ga limitations required by claims 13-15, 18, and 19, all of which ultimately depend from claim 1. As earlier noted, Argauer provides only generic  $W_2O_3:5-100YO_2$  ranges that are not specific for gallosilicates, but which appear to fall within the presently claimed Si/Ga limitations. However, Pieters provides *explicit* Si/Ga ranges for *gallosilicates*, and further, *in the context of oxygenate conversion to olefins*. Thus, one skilled in the art would look to Pieters' explicit teaching for Si/Ga ratio, which is outside the ranges of the present claims. Accordingly, the combined references fail to suggest or disclose the invention as presently claimed.

Even assuming *arguendo* that the Examiner has made out a *prima facie* case of obviousness, Applicants have rebutted that case with unexpected results with respect to claims 17-19 (which as presently amended are limited to conversion temperatures of 350° C. to 450° C). Applicants respectfully direct the Examiner to the specification's data in Table 6 (at page 18). The data show that, at higher temperatures (500° C and 550°C) as disclosed by Verduijn, unwanted methane selectivity has increased, whereas, at lower temperatures (400° C and 450°C), methane selectivity was significantly reduced. Applicants submit that a person of ordinary skill in the art would recognize from the data that temperatures lower than 400°C would also give similar results, *i.e.*, a reduction in methane selectivity. Thus, Applicants submit that they have demonstrated unexpectedness in a narrower temperature range of 350° to 450°C, which is within the temperature range of 275° to about 600°C disclosed in Verduijn, column 9, lines 50-51 (section u).

The Examiner has disregarded Applicants' earlier arguments of unexpectedness related to temperature range "since only claim 22 recites this range of temperature." Applicants respectfully submit that claims 17-19, based on the amended range of 350° to 450°C are adequately supported by the data set out in Table 6 and respectfully request the Examiner

consider these arguments relating to unexpectedness in considering the obviousness of the subject matter of claims 17-19.

For the foregoing reasons, Applicants respectfully request that the Examiner withdraw the rejection.

### **CONCLUSIONS**

For the reasons advanced above, Applicants respectfully submit that all pending claims as presently amended describe patentable subject matter. Allowance of the application with an early mailing date of the Notice of Allowance and allowability is therefore respectfully requested.

Should the Examiner have any further comments or questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2001B068).

Respectfully submitted,

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